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     (FILE 'HOME' ENTERED AT 07:48:09 ON 19 FEB 2004)
     FILE 'CA' ENTERED AT 07:48:20 ON 19 FEB 2004
L1    285 S (MEMS OR MICROCHIP OR MICROPLATE OR(MICRO OR MU)(1A)(TOTAL OR TAS) OR
LAB(2A)CHIP) AND CHROMATOGR?
L2     83 S L1 AND(SPRAY? OR ELECTROSPRAY? OR CAPILLARY)
L3     16 S L1 AND PUMP?
L4     36 S L2-3 NOT PY>2000
L5      7 S L2-3 NOT L4 AND PATENT/DT AND PY<2002
L6     43 S L4-5

=> d bib,ab 1-43 l6

L6   ANSWER 2 OF 43  CA  COPYRIGHT 2004 ACS on STN
AN   135:315580  CA
TI   On-line and off-line deposition of liquid samples for matrix assisted laser desorption
ionization-time of flight (MALDI-TOF) mass spectroscopy
IN   Karger, Barry L.; Foret, Frantisek; Preisler, Jan
PA   Northeastern University, USA
SO   U.S. Pat. Appl. Publ., 32 pp., Cont.-in-part of U.S. 6,175,112.
PI   US 2001033809     A1   20011025       US 2001-757079   20010109 <--
     US 6674070       B2   20040106
     US 6175112       B1   20010116       US 1998-83815    19980522 <--
PRAI US 1997-47489P    P    19970523
     US 1998-83815     A2   19980522
     US 2001-757079    A2   20010109
AB   A universal interface for continuous online liq. sample introduction directly to the
time-of-flight mass spectrometer, which can further promote throughput and utility of MALDI-
TOF MS, is disclosed.  Preferably, the liq. sample includes a matrix, either solid or liq.,
for use in matrix-assisted-laser-desorption-ionization, most particularly in a time-of-
flight mass spectrometer which can further promote throughput and utility of MALDI-TOF MS.
In the method of the invention, the same samples and matrixes, both solid and liq., can be
used as in conventional MALDI.  In practice of the method of the invention, a soln. of
sample contg., e.g., peptide and matrix is infused directly into the source chamber of a
mass spectrometer at subatmospheric pressure, deposited on a moving sample holder, such as a
rotating quartz wheel, and desorbed by, e.g., a nitrogen laser.  The method of the invention
is particularly amenable to multiplexing, the parallel deposition of multiple samples, e.g.,
from a capillary array or microchip channels, with subsequent sequential desorption with a
scanning laser.  This format is particularly useful for high throughput MS anal.  Also
disclosed is an off-line deposition chamber and a general method of prepg. a sample for
anal. that results in the homogeneous deposition of small quantities of sample at improved
reproducibility.  This format of sample prepn. is particularly useful with existing com.
mass spectrometers.

L6   ANSWER 3 OF 43  CA  COPYRIGHT 2004 ACS on STN
AN   135:124442  CA
TI   Separation media, multiple electrospray nozzle system and method
IN   Corso, Thomas N.; Schultz, Gary A.; Prosser, Simon J.; Huang, Xian
PA   Advanced Bioanalytical Services, Inc., USA
SO   PCT Int. Appl., 146 pp.
PI   WO 2001053819     A1   20010726       WO 2001-US1785   20010118 <--
     US 2002000517     A1   20020103       US 2001-764698   20010118
     US 6596988        B2   20030722
PRAI US 2000-176605P   P    20000118
AB   A microfabricated silicon chip with a sepn. material, such as in situ prepd. porous
polymer monoliths in its microchannels is disclosed.  The polymer monoliths are liq.-
permeable and serve as microcolumns for liq. chromatog., which are prepd. by in situ radical
polymn. of a mixt. contg. vinyl monomers and solvents (pyrogen) in the microchannels.  A
method and system are disclosed to generate one or more electrospray plumes from one or more
nozzles that provide an ion intensity as measured by a mass spectrometer that is approx.
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proportional to the no. of **electrospray** plumes formed for analyses contained within the fluid. A plurality of **electrospray** devices can be used in the form of an array of miniaturized sep. **electrospray** devices for the purpose of generating multiple **electrospray** plumes from multiple nozzles for the same fluid for anal.

L6 ANSWER 11 OF 43 CA COPYRIGHT 2004 ACS on STN
AN 133:263458 CA
TI Rapid isolation and identification of staphylococcal exoproteins by reverse phase **capillary** high performance liquid **chromatography-electrospray** ionization mass spectrometry
AU Kawano, Y.; Ito, Y.; Yamakawa, Y.; Yamashino, T.; Horii, T.; Hasegawa, T.; Ohta, M.
CS Department of Bacteriology, Nagoya University School of Medicine, Nagoya, Japan
SO FEMS Microbiology Letters (2000), 189(1), 103-108
AB The isolation of staphylococcal extracellular toxins and enzymes (exoproteins) usually requires time-consuming purifn. steps such as repeated chromatog. sepns. and isoelec. focusing. We performed rapid isolation, quantification and identification of staphylococcal exoproteins by reverse phase **capillary** high performance liq. chromatog.-**electrospray** ionization mass spectrometry (LC-ESI/MS) followed by the detn. of N-terminal amino acid sequences of sepd. peaks. We identified two novel exoproteins as well as previously reported antigens ORF-1 and ORF-2, glutamyl endopeptidase in Staphylococcus aureus NCTC8325 and protein A, staphylococcal enterotoxin C3 (SEC3), toxic shock syndrome toxin-1 (TSST-1) and α-toxin in a clin. isolate methicillin-resistant S. aureus (MRSA) 3543. MRSA3543 secreted 5.33 and 1.45 μg of SEC3 and TSST-1 per 20 μg **total** exoproteins ml-1, resp. The **capillary** LC treatment of the exoprotein fraction sepd. at least 12 peaks, indicating its high-resoln. power. We found that when a protein was once detd. by its N-terminal sequence, its mass spectrum and the obtained mol. mass was applicable for the assignment of the protein.

L6 ANSWER 16 OF 43 CA COPYRIGHT 2004 ACS on STN
AN 132:259868 CA
TI A miniaturized total chemical analysis system: μ-**TAS**
AU Eijkel, Jan C. T.; De Mello, Andrew J.; Manz, Andreas
CS Zeneca/SmithKline Beecham Centre for Analytical Sciences, Imperial College, London, SW7 2AY, UK
SO Organic Mesoscopic Chemistry (1999), 185-219. Editor(s): Masuhara, Hiroshi; De Schryver, Frans C. Publisher: Blackwell Science Ltd., Oxford, UK.
AB A review with 139 refs. An integrated system that performs all anal. steps (i.e. sampling, sample pretreatment, sample transport, chem. reactions, analyte sepn., detection, product isolation and data anal.) in an automated manner is called a total anal. system (TAS). The concept of a downscaled TAS was first formulated in 1990 and was christened a μ-**TAS**. Miniaturization would decrease reagent and carrier consumption, and lead to increased sepn. efficiencies and decreased anal. times. Micromachining, fluid-handeling components, system integration, theory of miniaturization, and anal. application are discussed.

L6 ANSWER 17 OF 43 CA COPYRIGHT 2004 ACS on STN
AN 132:224214 CA
TI Integrated monolithic microfabricated **electrospray** and liquid **chromatography** system for use with mass spectrometry
IN Moon, James E.; Schultz, Gary A.; Corso, Thomas N.; Davis, Timothy J.; Galvin, Gregory J.; Lowes, Stephen
PA Advanced Bioanalytical Services, Inc., USA; Kionix, Inc.
SO PCT Int. Appl., 84 pp.

PI	WO 2000015321	A1	20000323	WO 1999-US20066	19990901 <--
	US 6563111	B1	20030513	US 2000-703246	20001031
	US 6569324	B1	20030527	US 2000-703005	20001031
	US 6579452	B1	20030617	US 2000-707653	20001107
PRAI	US 1998-156507	A	19980917		
	WO 1999-US20066	W	19990901		

AB A microfabricated anal. device is described comprising a liq. chromatog. device and an **electrospray** device for use with a mass spectrometry system. The **electrospray** device includes a substrate defining a channel between an entrance orifice and an exit orifice on an injection surface, a nozzle defined by a portion recessed from the ejection surface

surrounding the exit orifice, and an electrode for application of an elec. potential to the substrate to optimize and generate an **electrospray**. The exit orifice of the liq. chromatog. device may be homogeneously interfaced with the entrance orifice of the **electrospray** device to form an integrated single system.

L6 ANSWER 20 OF 43 CA COPYRIGHT 2004 ACS on STN
AN 132:102165 CA
TI Electroosmosis- and pressure-driven **chromatography** in chips using continuous beds
AU Ericson, Christer; Holm, Johan; Ericson, Thomas; Hjerten, Stellan
CS Department of Biochemistry Biomedical Center, University of Uppsala, Uppsala, S-751 23, Swed.
SO Analytical Chemistry (2000), 72(1), 81-87
AB The application range of **microchips** can be extended to any mode of chromatog. by filling the narrow channels with continuous polymer beds, exemplified by electrochromatog. and ion-exchange chromatog. Wall effects are eliminated by anchoring the bed to the wall of the channel, an arrangement which has the addnl. advantage that no frits to support the bed are required. The design of the equipment is based on a quartz chip with all auxiliary pieces (for example, electrode vessels and fluid transfer fittings) placed in a rack, which permits a flexibility of great importance for automation. The same resoln. and van Deemter plots were obtained in expts. performed in fused-silica **capillaries** and in chips for both low-mol.-wt. (alkyl phenones, antidepressants) and high-mol.-wt. substances (proteins). A sample of uracil, phenol, and benzyl alc. was sepd. by electrochromatog. in <20 s.

L6 ANSWER 28 OF 43 CA COPYRIGHT 2004 ACS on STN
AN 130:10122 CA
TI The laboratory on a chip: a new approach to chemical analysis and beyond
AU Craston, Derek; Cowen, Simon
CS LGC Teddington Ltd, Teddington/Middlesex, TW11 0LY, UK
SO Science Progress (Northwood, United Kingdom) (1998), 81(3), 225-244
AB A review with 9 refs. Advances in microengineering now make possible the fabrication of microcomponents such as **pumps** and valves that are only a few cubic millimeters in size. Current trends suggest that these components might be mass-produced easily, using inexpensive materials such as polymers. By combining individual components, microsystems that perform useful chem. or biochem. functions (**labs**. on a **chip**) should be within reach. To date, most work in microsystems was concerned with its application to chem. anal., where it is anticipated that miniaturization will provide systems for carrying out at-site measurement, at very low cost and with fast response. The combination of anal. steps within a microsystem, which may include within it a chem. sensor, should provide more reliable anal. than can be achieved by a sensor on its own. Potential applications of microsystems extend beyond just anal., with the technol. also likely to impact in areas such as chem. synthesis. This article reviews current developments, including the enabling technol., theor. performance of on-chip systems, and future trends.

L6 ANSWER 31 OF 43 CA COPYRIGHT 2004 ACS on STN
AN 126:48663 CA
TI Fully integrated miniaturized planar liquid sample handling and analysis device
IN Swedberg, Sally A.; Kaltenbach, Patrick; Witt, Klaus E.; Bek, Fritz; Mittelstadt, Laurie S.
PA Hewlett Packard Company, USA
SO U.S., 35 pp., Cont.-in-part of U.S. 5,500,071.

PI	US 5571410	A	19961105	US 1995-486024	19950607
	US 6093362	A	20000725	US 1999-249531	19990211
PRAI	US 1994-326111	A2	19941019		

AB The miniaturized total anal. system (**μ-TAS**) comprises a miniaturized planar column for liq. anal. The **μ-TAS** comprises microstructures fabricated from novel support substrates other than Si or SiO2, such as Kapton, by laser ablation. The **μ-TAS** includes assocd. laser-ablated features required for integrated sample anal., such as analyte detection means and fluid lines, and is useful in any anal. system for detecting and analyzing small and/or macromol. solutes in the liq. phase. The system may employ chromatog. sepn., electrophoretic sepn., electrochromatog. sepn., or combinations of sepn. methods. In an example, IgG, IgA, and IgM were detd. in blood serum, using a Kapton device contg. a capture

matrix such as a membrane contg. protein A/G, followed by desalting in an anticonvective medium such as polyacrylamide and then, analyte band focusing in a gel matrix, followed by **capillary** zone electrophoresis and post-column derivatization.

L6 ANSWER 33 OF 43 CA COPYRIGHT 2004 ACS on STN
AN 123:245298 CA
TI **μ-TAS**: Miniaturized total chemical analysis systems
AU Manz, Andreas; Verpoorte, Elisabeth; Raymond, Daniel E.; Effenhauser, Carlo S.; Burggraf, Norbert; Widmer, H. Michael
CS Corporate Analytical Research, Ciba-Geigy Ltd., Basel, CH-4002, Switz.
SO Micro Total Anal. Syst., Proc. μTAS '94 Workshop, 1st (1995), Meeting Date 1994, 5-27. Editor(s): Van den Berg, Albert; Bergveld, Piet. Publisher: Kluwer, Dordrecht, Neth.
AB A review, with 83 refs., is given. The miniaturized total chem. anal. system is a concept for online monitoring combining classical anal. techniques and photolithog. defined micro structures. Examples of Si and glass micro structures for flow-injection anal., **capillary** liq. chromatog. and **capillary** electrophoresis are given. The results obtained indicate faster sepns., dramatically reduced reagent consumption, and access to novel types of anal. techniques.

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(FILE 'HOME' ENTERED AT 06:36:34 ON 19 FEB 2004)
FILE 'CA' ENTERED AT 06:36:45 ON 19 FEB 2004
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L1 92 S E3,E15
E CHOU HO/AU
L2 14 S E18
E QUAKE S/AU
L3 61 S E3-8
E UNGER M/AU
L4 69 S E3-4,E20-21,E25-26
E SCHERER A/AU
L5 173 S E3,E19
L6 1 S L1-2 AND L3 AND L4 AND L5
L7 14 S L1-5 AND ELASTOMER?
L8 25 S L1-5 AND (VALVE OR PUMP)
FILE 'BIOSIS' ENTERED AT 06:43:42 ON 19 FEB 2004
L9 2 S L6-8
FILE 'MEDLINE' ENTERED AT 06:44:20 ON 19 FEB 2004
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L11 20 S L6-8
FILE 'JICST-EPLUS' ENTERED AT 06:49:09 ON 19 FEB 2004
L12 1 S L6-8
FILE 'COMPUSCIENCE' ENTERED AT 06:50:56 ON 19 FEB 2004
L13 0 S L6-8
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L14 50 DUP REM L6 L7 L8 L9 L10 L11 L12 (21 DUPLICATES REMOVED)

=> d bib,ab l14 1-50

L14 ANSWER 2 OF 50 CA COPYRIGHT 2004 ACS on STN
AN 138:86060 CA
TI Microfluidic device for combinatorial synthesis of array of oligonucleotides or other compounds
IN Van Dam, R. Michael; **Unger, Marc A.**; **Quake, Stephen R.**
PA California Institute of Technology, USA
SO U.S. Pat. Appl. Publ., 34 pp., Cont.-in-part of U.S. Ser. No. 679,432.
PI US 2003008411 A1 20030109 US 2002-116761 20020403
US 6508988 B1 20030121 US 2000-679432 20001003
PRAI US 2000-679432 A2 20001003
AB The present invention provides a microfluidic device for synthesizing an array of compds. and methods for using the same. In particular, the microfluidic device of the present invention comprises a solid support base, an **elastomeric** layer attached to the solid support, and a plurality of flow channels located within the interface between the solid support and the **elastomeric** layer. In addn., the solid support comprises a functional group for forming a bond with a reactive reagent. In some embodiments, the microfluidic device further comprises a second plurality of flow channels that intersect the first plurality of flow channels. A plurality of control channels are also present in the microfluidic devices of the present invention. The control channels can be actuated to regulate flow of fluids within the flow channel(s). A process for synthesizing an array of all possible DNA 6-mers using a chem. app. of the present invention which has one **elastomer** member is described. A method for synthesizing an array of all possible DNA 4-mers using a microfluidic device of the present invention which includes a solid support with a two-layer elastic device contg. valves for controlling the fluid flow is also described.

L14 ANSWER 15 OF 50 CA COPYRIGHT 2004 ACS on STN
AN 136:244001 CA
TI Integrated active flux microfluidic devices and methods
IN **Quake, Stephen R.**; **Chou, Hou-Pu**

PA California Institute of Technology, USA
SO U.S. Pat. Appl. Publ., 72 pp., Cont.-in-part of U.S. Ser. No. 724,548.
PI US 2002037499 A1 20020328 US 2001-875438 20010605
PRAI US 2000-209243P P 20000605
AB The invention relates to a microfabricated device for the rapid detection of DNA, proteins or other mols. assocd. with a particular disease. The devices and methods of the invention can be used for the simultaneous diagnosis of multiple diseases by detecting mols. (e.g. amts. of mols.), such as polynucleotides (e.g., DNA) or proteins (e.g., antibodies), by measuring the signal of a detectable reporter assocd. with hybridized polynucleotides or antigen/antibody complex. In the microfabricated device according to the invention, detection of the presence of mols. (i.e., polynucleotides, proteins, or antigen/antibody complexes) are correlated to a hybridization signal from an optically-detectable (e.g. fluorescent) reporter assocd. with the bound mols. These hybridization signals can be detected by any suitable means, for example optical, and can be stored for example in a computer as a representation of the presence of a particular gene. Hybridization probes can be immobilized on a substrate that forms part of or is exposed to a channel or channels of the device that form a closed loop, for circulation of sample to actively contact complementary probes. Universal chips according to the invention can be fabricated not only with DNA but also with other mols. such as RNA, proteins, peptide nucleic acid (PNA) and polyamide mols.

L14 ANSWER 35 OF 50 MEDLINE on STN
AN 2000217216 MEDLINE
TI Monolithic microfabricated **valves** and **pumps** by multilayer soft lithography.
AU **Unger M A**; **Chou H P**; Thorsen T; **Scherer A**; **Quake S R**
CS Department of Applied Physics, California Institute of Technology, Pasadena, CA 91125, USA.
SO SCIENCE, (2000 Apr 7) 288 (5463) 113-6.
AB Soft lithography is an alternative to silicon-based micromachining that uses replica molding of nontraditional **elastomeric** materials to fabricate stamps and microfluidic channels. We describe here an extension to the soft lithography paradigm, multilayer soft lithography, with which devices consisting of multiple layers may be fabricated from soft materials. We used this technique to build active microfluidic systems containing on-off **valves**, switching **valves**, and **pumps** entirely out of **elastomer**. The softness of these materials allows the device areas to be reduced by more than two orders of magnitude compared with silicon-based devices. The other advantages of soft lithography, such as rapid prototyping, ease of fabrication, and biocompatibility, are retained.

L14 ANSWER 36 OF 50 INSPEC (C) 2004 IEE on STN
AN 2001:6911377 INSPEC DN A2001-11-8770E-004; B2001-06-7510-010
TI Integrated **elastomer** fluidic lab-on-a-chip-surface patterning and DNA diagnostics.
AU Hou-Pu Chou; **Unger, M.A.**; **Scherer, A.**; **Quake, S.R. (Dept. of Electr. Eng., California Inst. of Technol., Pasadena, CA, USA)**
SO Technical Digest. Solid-State Sensor and Actuator Workshop (TRF Cat. No.00TRF-0001) Cleveland, OH, USA: Transducers Res. Found, 2000. p.111-14 of xvi+376 pp. 12 refs. Also available on CD-ROM in PDF format Conference: Hilton Head Island, SC, USA, 4-8 June 2000 Sponsor(s): Transducers Res. Found
AB We recently developed a method of multilayer fabrication for **elastomeric** devices, which we used to fabricate monolithic active **valves** and **pumps**. Here we describe efforts to use these **pumps** and **valves** in an integrated DNA diagnostic chip and show results of a key component, surface patterning, with two different kind of surface chemistries by using similar **elastomeric** channel devices. Flow control, reagent metering, in-line mixing and loop circulations are also demonstrated.

L14 ANSWER 40 OF 50 CA COPYRIGHT 2004 ACS on STN
AN 129:51505 CA
TI Microfabricated devices for sizing DNA and sorting cells
AU **Chou, Hou-Pu**; Spence, Charles; **Scherer, Axel**; **Quake, Stephen**
CS Department of Electrical Engineering, California Institute of Technology, Pasadena, CA, 91125, USA
SO Proceedings of SPIE-The International Society for Optical Engineering (1998),

3258(Micro- and Nanofabricated Structures and Devices for Biomedical Environmental Applications), 181-187
AB We have microfabricated devices to size and sort microscopic biol. objects, ranging from cells to single mols. of DNA. Sizing is accomplished by fluorescent excitation and detection. The devices are fabricated in a silicone **elastomer** using a replica method. Single mols. of DNA have been sized to 10% accuracy, and manipulation of E. Coli cells has been demonstrated.

L14 ANSWER 41 OF 50 INSPEC (C) 2004 IEE on STN
AN 1999:6208576 INSPEC DN A1999-09-8780B-009; B1999-05-7230J-005
TI Disposable microdevices for DNA analysis and cell sorting.
AU Hou-Pu Chou; Spence, C.; Anne Fu; **Scherer, A.; Quake, S. (Dept. of Appl. Phys., California Inst. of Technol., Pasadena, CA, USA)**
SO Technical Digest. Solid-State Sensor and Actuator Workshop Cleveland, OH, USA: Transducer Res. Found, 1998. p.11-14 of xiv+382 pp. 5 refs. Conference: Hilton Head Island, SC, USA, 8-11 June 1998 Sponsor(s): Transducers Res. Found
AB We have developed microfabricated devices to size and sort microscopic objects, based on measurement of fluorescent properties. With these devices, we have demonstrated sizing and sorting on various biological entities, ranging from E. Coli cells to single molecules of DNA. The microfabricated devices have several advantages over macroscopic systems, including size, cost and sensitivity. For example, the detection volume for our devices is 375 femtoliters, more than an order of magnitude smaller than what has been achieved with flow cytometry.

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